Final Polychlorinated Biphenyl Work Plan

Prepared for

Regulatory Agencies

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CH2MHILL

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Acronyms and Abbreviations

AL	assessment location
CA/FO	Consent Agreement/Final Order
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DTSC	State of California Environmental Protection Agency, Department of Toxic Substances Control
EBS	Environmental Baseline Survey
EETP	Eastern Early Transfer Parcel
EPC	exposure point concentration
HSP	Health and Safety Plan
IA	investigation area
LMI	Lennar Mare Island, Limited Liability Corporation
µg/100 cm^2	micrograms per 100 square centimeters
mg/kg	milligrams per kilogram
MINS	Mare Island Naval Shipyard
MS/MSD	matrix spike and matrix spike duplicate
Navy	US Department of Navy
NFA	No Further Action
PCB	polychlorinated biphenyl
ppm	parts per million
PRG	preliminary remediation goal
QAPP	Quality Assurance Project Plan
SCR	Substantive Cleanup Requirements
SOP	standard operating procedure
SGWMP	Soil and Groundwater Management Plan
SSPORTS	Supervisor of Shipbuilding, Conversion, and Repair, Portsmouth, Virginia, Environmental Detachment

TSCA	Toxic Substances Control Act
TtEMI	Tetra Tech EM, Inc.
TWD	Technical Work Document
UCL	upper confidence limit
UL	unknown location
USEPA	U.S. Environmental Protection Agency

1.0 Introduction

This section presents the document objectives, document organization, project organization, and how this work plan for polychlorinated biphenyl (PCB) sites is integrated with the sitewide documents.

1.1 Document Objectives

This PCB work plan has been prepared by CH2M HILL in accordance with the Consent Agreement (LMI et al. 2001a) signed April 16, 2001 between Lennar Mare Island (LMI), the City of Vallejo, and the State of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and the Consent Agreement/Final Order (CA/FO) between the LMI, United States Environmental Protection Agency (USEPA), United States Department of the Navy (Navy), and the City of Vallejo (LMI et al. 2001b). The CA/FO specifically addresses the provisions of the Toxic Substances Control Act (TSCA).

This work plan addresses the PCB sites within the Eastern Early Transfer Parcel (EETP) at Mare Island. This work plan provides a generic sampling and cleanup approach for the PCB sites. Site-specific information, organized by Investigation Area (IA), is provided in the appendices to this document, organized by IA. The objectives of this document are to:

- Summarize previous sampling at the PCB sites within the EETP.
- Summarize previous remedial actions at the PCB sites within the EETP.
- Present process for completing necessary actions under TSCA.
- Present process for completing necessary actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- Provide standard operating procedures (SOPs) for PCB sampling and interim remedial actions at the PCB sites.
- Provide an implementation schedule for the remaining PCB work in the EETP.

1.2 Document Organization

Section 1.0 presents the scope, objectives, and structure of this PCB work plan. Section 2.0 provides background information for Mare Island, including general island history and description of the Navy PCB program. Section 3.0 contains an overview of regulatory agency participation. Sections 4.0 and 5.0 provide the process for completing necessary actions under TSCA and CERCLA, respectively. These two sections also provide a generic sampling approach and process for site remediation at the PCB sites. Section 6.0 outlines the process for obtaining regulatory closure of the PCB sites in the EETP. Section 7.0 provides descriptions of the SOPs, including health and safety, sampling, interim remedial actions,

and deed restrictions. The implementation schedule is provided in Section 8.0. References are provided in Section 9.0.

1.3 Project Organization

This PCB work plan covers one aspect of the LMI Early Transfer Project. Jill Bensen is the Program Manager and will have overall responsibility for the program. The responsibility of this work plan and its implementation belongs to the compliance site Project Manager, Carla Duncan. As shown in the project organization chart, Figure 1.3-1, Carla Duncan reports to Jeff Morris, Technical/Regulatory Manager, who reports to Jill Bensen, Program Manager.

Carla Duncan will use CH2M HILL staff and subcontractors, as needed, during the implementation of this work plan.

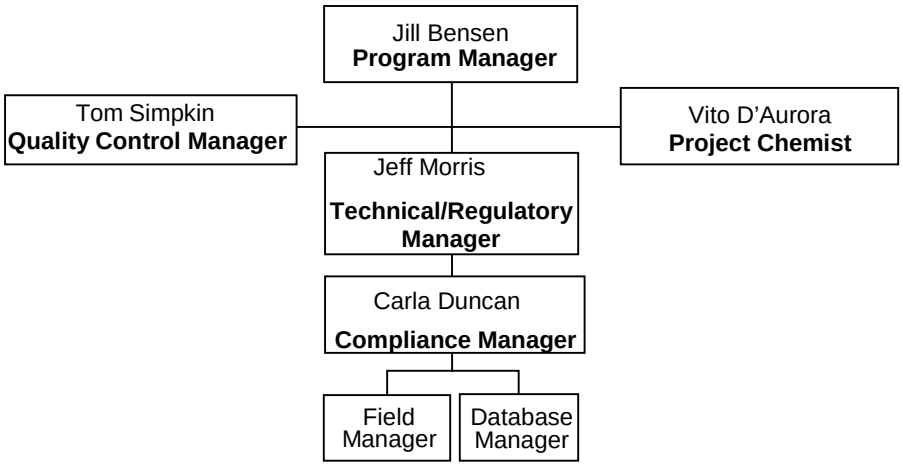

Figure 1.3-1

PCB Work Plan
Project Organization Chart

1.4 Integration of Sitewide Documents

This PCB work plan is submitted to the regulatory agencies in parallel with the *Quality Assurance Project Plan* (QAPP) (CH2M HILL 2001a) and the *Soil and Groundwater Management Plan* (SGWMP) (CH2M HILL 2001b). The specific sampling methodology, documentation, shipment, and quality control specifications for the implementation of this work plan can be found in the QAPP or, for more specialized issues, in the appendices included at the back of this document.

The PCB work plan will be implemented following the sitewide health and safety plan (HSP) presented in Appendix G of the SGWMP. Additional PCB-specific health and safety forms and procedures are provided in Appendix A of this work plan.

2.0 Background

PCBs are a group of synthetic organic chemicals that were manufactured in the United States from 1929 to 1977. PCBs were commonly used in electrical equipment because of ideal physical-chemical properties (low electrical and high thermal conductivity, high boiling point and chemical stability, and flame-retardant properties). The 1976 Toxic Substances Control Act (TSCA; Public Law 94-469) prohibited further manufacture of PCBs in the United States because they are classified by USEPA as persistent, bioaccumulative, and toxic compounds.

This section provides a brief description and history of Mare Island, summary of the Navy's PCB program, descriptions of the PCB sites in the EETP, and a summary of the previous PCB site remedial actions.

2.1 Description and History of Mare Island

The former Mare Island Naval Shipyard (MINS) is located on a peninsula approximately 30 miles northeast of San Francisco (Figure 2.1-1). The peninsula is bounded to the east, south, and west by the Napa River (Mare Island Strait), Carquinez Strait, and San Pablo Bay, respectively. Mare Island was originally an island comprising shale, siltstone, and sandstone and covering approximately 1,000 acres, with surrounding wetlands of approximately 300 acres. Over time, the placement of fill materials and dredge tailings has transformed the island to the current peninsula that covers over 5,600 acres.

The Navy purchased Mare Island in 1853 and commenced shipbuilding operations the following year. The primary ship construction and maintenance area of MINS was established along the northeastern shore of the original island adjacent to Mare Island Strait. The entire facility saw vast transformations during its years of operation as shipbuilding technologies advanced from wooden to steel construction and wind power to nuclear propulsion. In the early 1920s, the Navy initiated construction and maintenance of submarines at MINS. During World War II, MINS reached peak capacity for shipbuilding, repair, overhaul, and maintenance. Following the war, MINS was considered a primary station for construction and maintenance of the Navy's Pacific fleet of submarines. Because of changing Navy needs in a postwar environment, shipyard activity decreased. MINS was closed on April 1, 1996, after 142 years of operation.

2.2 Overview of Navy PCB Program

The Navy's PCB program at MINS included identifying, retrofitting, and removing PCB-contaminated equipment, assessing locations of potential releases of PCBs, and performing abatement activities, as necessary. Documentation of the Navy PCB site assessment, sampling, and abatement activities is contained in the *Final Basewide Polychlorinated Biphenyl Confirmation Sampling Report* (TtEMI 1998).

From visual site surveys, as well as review of historical records, building closure reports, and databases of electrical equipment, transformers, and switches, the Navy identified 415 PCB sites in the EETP at the former MINS where PCB-containing equipment was located or where PCB spills were documented (TtEMI 2001). Navy personnel from Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Virginia, Environmental Detachment (SSPORTS) conducted interim PCB assessments at the identified PCB sites and performed abatement activities (i.e., washing, scabbling, excavation) where necessary. Sample results from 62 percent of the SSPORTS interim PCB assessment locations (ALs) did not have PCB concentrations greater than 1 milligram per kilogram (mg/kg).

SSPORTS categorized the type of sampling at the PCB sites as either suspect, stain-specific, or grid. Approximately 41 percent of the PCB sites were categorized as suspect locations, meaning that there was no evidence of a release but there was PCB-containing equipment nearby. Approximately 43 percent of the sites were stain-specific locations. Grid sampling was used at 7 percent of the PCB sites. The type of sampling was not specified at the remaining 9 percent of the PCB sites.

Confirmation sampling was subsequently performed by Tetra Tech EM, Inc. (TtEMI) to confirm SSPORTS' findings of whether abatement was not necessary, or to determine the effectiveness and verify completion of the performed PCB abatement activities (TtEMI 1998). Over 1,100 samples were collected by TtEMI at the PCB sites subject to the Consent Agreement and the CA/FO.

2.3 Description of the PCB Sites in the EETP

The IA-specific site identification technical memoranda identified all of the PCB sites (both those listed and not listed in the Consent Agreement) and provided information on the SSPORTS initial assessment, abatement activities, and the TtEMI confirmation sampling (CH2M HILL 2001c, 2002a-f).

The SSPORTS PCB assessment effort was conducted and documented by the geographical property classification identified in the Environmental Baseline Survey (EBS). Therefore each PCB site is located within a specific EBS parcel.

2.3.1 PCB Sites Listed in the Consent Agreement

The Consent Agreement lists 428 PCB sites in the EETP. However, after further evaluation, 11 of these PCB sites were determined to be located immediately outside of the EETP boundary (not located on LMI property and therefore the Navy is responsible for site closure). Also, there are two PCB sites (Building 163 and Building 832) that the Navy, City of Vallejo, and LMI have agreed are Navy-retained conditions because the Navy was in the process of remediating these sites at the time of title transfer. Therefore, there are 415 PCB sites which are listed in the Consent Agreement and subject to this PCB work plan. All 428 sites in the Consent Agreement are listed in Table 2.3-1. This table provides the IA and EBS parcel, PCB site name and description, site location, LMI proposed land use (LMI 2000), type and matrix of PCB sampling, SSPORTS maximum PCB concentration, number of SSPORTS samples (both initial assessment and Technical Work Document [TWD]), number and maximum concentration of TtEMI confirmation samples, and the maximum remaining PCB concentration.

According to the *Preliminary Land Use Plan* (LMI 2000), there are 365 PCB sites in a restricted use area (industrial/commercial reuse), 48 sites in an unrestricted use area (residential reuse), two sites in a recreational area (park reuse). The majority of these sites (232 sites) are located outside of buildings. Also, 60 of the 415 PCB sites are considered low-occupancy sites. Examples of low-occupancy areas include electrical substations or areas in an industrial facility where workers spends small amounts of time per week (e.g., vaults, unoccupied areas outside, fenced enclosures, non-office space in a warehouse).

2.3.2 PCB Sites Not Listed in the Consent Agreement

Through reviews of historic documents and visual site surveys, 117 additional PCB sites were identified in the EETP. These sites are listed in Table 2.3-2. Supporting information pertaining to the identification of these additional PCB sites was provided in the IA-specific site identification technical memoranda (CH2M HILL 2001c, 2002a-f). Table 2.3-2 provides the PCB site name, initial assessment PCB concentration and number of samples, and any available information regarding PCB confirmation sampling.

The majority of these sites are located inside buildings. According to the *Preliminary Land Use Plan* (LMI 2000), 112 of these PCB sites are in a restricted use area and five are located in an unrestricted use area. Also, 14 of these 117 PCB sites are considered low-occupancy sites.

2.4 Previous PCB Site Remedial Actions

The majority of the PCB sites with initial assessment PCB concentrations of greater than 1.0 mg/kg or 10 micrograms per 100 square centimeters (µg/100 cm^2) have already been remediated by SSPORTS and subsequently sampled by TtEMI for confirmation of successful abatement. A summary of the previous remedial actions at the PCB sites in the EETP is provided in Table 2.4-1. This table includes both the initial assessment PCB concentration and the confirmation sample results following each SSPORTS TWD. The TWDs were essentially a SSPORTS work plan for the PCB site remediation activities. SSPORTS collected over 2,000 samples following the TWDs, and TtEMI collected over 490 confirmation samples at the sites that had previous remedial actions (Table 2.4-1).

Remedial actions have occurred at 164 PCB sites in the property subject to the Consent Agreement. The majority of these sites required either washing or scabbling. Washing was a remedial action at 40 percent of the sites. Scabbling (removing the surface of the concrete) was performed at 32 of the sites. At seven of these sites, complete concrete removal was necessary following the scabbling; three of these sites were building floors with known cracks, and the other four sites were transformer pads where information regarding the migration pathway was not available. The maximum depth of scabbling required to reach cleanup standards was 3 inches, and the average scabbling depth was 1 inch. A few indoor PCB sites also required wood block or tile removal (Table 2.4-1). Soil excavation was required at 19 of the PCB sites (Table 2.4-1). Six of the PCB sites have already been encapsulated.

The maximum remaining PCB concentration is less than or equal to 1.0 mg/kg or 10 µg/100cm^2 at 80 percent of the sites listed in the Consent Agreement and 40 percent of the sites not listed in the Consent Agreement (see Tables 2.3-1 and 2.3-2). At the time of the

Consent Agreement, only three PCB sites listed in the Consent Agreement (Building 535 AL#02 [loading dock], Building 680 AL#01 [first floor], and Building 680 B [fifth floor]) have remaining elevated PCB concentrations (i.e., greater than 50 mg/kg) (Table 2.3-1). Five of the PCB sites not listed in the Consent Agreement (Building 121 unknown location [UL]#01, Building 680 UL#08 [pit #5], and Building 680 UL#10 [pit #7], Building 688 UL#01, and Building 516A UL#01) have remaining elevated PCB concentrations (Table 2.3-2).

Insert Figure 2.1-1

Insert 8.5 x 11 Table 2.3-1

Insert 8.5 x 11 Table 2.3-2

Insert 11 x 17 Table 2.4-1

3.0 Regulatory Agency Participation

This section provides information related to regulatory agency participation on the PCB sites in the EETP at Mare Island. PCB sites in the EETP are subject to closure under both TSCA and CERCLA, under the CA/FO (LMI et al. 2001b) and the Consent Agreement (LMI et al. 2001a), respectively. Closure requirements for PCB contaminated material pursuant to the TSCA regulations at 40 CFR part 761 are regulated by the USEPA. Closure requirements for PCB contaminated material pursuant to the CERCLA regulations are regulated by DTSC.

3.1 PCB Site Closure Under TSCA

Figure 3.1-1 shows the process for PCB site closure under TSCA, as defined in the USEPA CA/FO for the EETP at Mare Island (LMI et al. 2001b). Through meetings with USEPA in March and May 2002, it was agreed that only PCB sites where abatement has been performed or sites with a maximum detected PCB concentration of greater than 1.0 mg/kg or 10 μg/100cm^2 would be subject to additional TSCA evaluation (USEPA 2002a).

PCB sites subject to additional TSCA evaluation are then further separated by the following factors:

- Need for site-specific work plan
  - Because of the complexity of the PCB sites at Buildings 535, 680, and 742, separate site-specific work plans will be prepared to address TSCA and/or CERCLA remedial action and closure at these sites.
- Characterization or remediation after August 28, 1998
  - PCB sites with site-specific, risk-based closure or which had initial characterization or remediation after August 28, 1998 will be remediated in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p). This is because the PCB regulations were amended in the EPA Disposal of PCBs Final Rule (Federal Register: Volume 63, Number 124; promulgated June 29, 1998, but effective August 28, 1998) and the 40 CFR 761 Regulations (Subparts N and O).
  - Risk-based closure sites must follow the requirements of CA/FO paragraph 8(b) (LMI et al. 2001b).
- Site with encapsulated concrete, in use with remaining useful life
  - In accordance with 40 CFR 761.30(p), there are six PCB sites (Building 672 AL#01, Building 690 AL#01, Building 898 AL#01, Building 1310 AL#01, Building 1322 AL#01, and Building H72 AL#01) that are already encapsulated concrete (solid barrier fastened to surface and covering the contaminated area), still currently in use, and have a remaining useful life.
  - Encapsulated sites must follow the requirements of the CA/FO paragraphs 7, 8(c), 9, 10, and 11 (LMI et al. 2001b).
- Site categorized as high or low occupancy

  - According to definitions in the TSCA Regulations (40 CFR 761), a PCB site with residential reuse is considered a high-occupancy area. In addition, an industrial area where a worker spends more than 6.7 hours per week is also considered a high-occupancy area. Low-occupancy areas are defined as any area where PCB remediation waste has been disposed of on site (i.e., PCB contamination remains in place) and where occupancy for any individual not wearing dermal and respiratory protection for a calendar year is less than 16.8 hours per week for non-porous surfaces (metal) and less than 6.7 hours per week for porous surfaces or soil.
- Media categorized as porous or non-porous
  - A porous surface means any surface into which PCBs may potentially penetrate (i.e., asphalt, concrete, soil, and wood). Non-porous surface means a smooth, unpainted solid surface that limits penetration of liquid containing PCBs beyond the immediate surface (i.e., uncorroded metal).
- Need for additional verification sampling
  - Additional samples may be required at some PCB sites if the number of previous samples or distribution of sample locations are not adequate, previous samples did not include a necessary media, or site-specific conditions appear to warrant further evaluation.
- Maximum remaining PCB concentration
  - The maximum remaining PCB concentration will aid in determination of the applicable remedial action, as defined in the CA/FO or in accordance with either 40 CFR 761.61 or with 40 CFR 761.30(p).

3.2 PCB Site Closure Under CERCLA

PCB sites subject to additional TSCA evaluation can also be subject to CERCLA if there is a known release to soil or groundwater or there is a potential threat for a release of PCBs to the environment. A potential threat is determined by the following three criteria: 1) potential PCB source present; 2) PCB contamination present; and 3) there is a visible pathway for migration (e.g., crack in a concrete pad).

Figure 3.1-1 also shows the process for PCB site closure under CERCLA. Select PCB sites in the EETP are subject to CERCLA and will be carried through the CERCLA process ultimately leading to a decision that based on existing PCB concentrations: 1) no action is necessary to remediate those concentrations, or 2) appropriate remediation performed followed by a decision that the no further action (NFA) criteria have been met.

PCB sites where there was a release to soil or groundwater will be subject to CERCLA closure. For those PCB sites where there is no known release to soil or groundwater, and:

1) where there is a potential source of PCBs and PCB contamination is present at the site, and

2) the site will not be encapsulated or capped under TSCA with a deed restriction,

the site will be evaluated to determine if there is a visible pathway for migration to soil and/or groundwater. A limited investigation will be performed if there is a visible pathway for migration to determine if there has been a release of PCBs to the environment. If a release is confirmed, then additional site characterization will be performed under

CERCLA, if necessary. If a release is not confirmed, then the PCB site will only be subject to closure under TSCA. To close PCB sites under CERCLA, the site will either be remediated to the appropriate Preliminary Remediation Goal (PRG, industrial or residential) or subjected to site-specific, risk-based closure.

3.3 TSCA/CERCLA Integration

All PCB sites in the EETP will be evaluated according to the PCB site closure flowchart (Figure 3.1-1). The flowchart depicts the methods for determining which PCB sites are subject to additional TSCA evaluation and the process required to achieve agency concurrence that no further action is required under CERCLA. Sections 4.0 and 5.0 of this PCB work plan provide more specifics regarding the process for completing necessary actions under TSCA and CERCLA, respectively.

PCB sites that are either remediated to CERCLA PRGs or subject to site-specific, risk-based closure under CERCLA by default will satisfy any TSCA requirements for site closure. This is because the CERCLA PRGs are more restrictive than TSCA cleanup standards; and a site-specific, risk-based closure process satisfies both USEPA and DTSC.

In addition, it is important to note that Paragraph 6.b. of the CA/FO states that the Navy remains ultimately responsible for PCB site remediation and ultimate disposal in accordance with the CA/FO in the unlikely event that LMI, the City of Vallejo, or subsequent land owners default on performance of PCB cleanup activities pursuant to the CA/FO (LMI et al. 2001b). Future occupants of structures will be required to comply with any applicable deed restrictions as a condition of their tenancy.

Insert 11 x 17 Figure 3.1-1 PCB Site Closure - color

4.0 Process for Completing Necessary Actions Under TSCA

This section provides a description of the process for completing necessary actions at the PCB sites in the EETP at Mare Island under TSCA.

4.1 Introduction

The process for completing necessary actions at the PCB sites in the EETP at Mare Island under TSCA is shown in Figure 3.1-1. According to this figure, a PCB site is subject to additional TSCA evaluation if the maximum PCB concentration exceeds 1.0 mg/kg, exceeds 10 µg/100cm^2, or abatement has been performed at the site. Table 4.1-1 provides a list of the 225 PCB sites in the EETP that are subject to additional TSCA evaluation. Of these 224 PCB sites, 156 were listed in the Consent Agreement and 69 were identified by CH2M HILL through review of Navy documents and site survey notes.

4.2 Overview of Approach for TSCA Actions

Based on professional judgment, there are PCB sites at three buildings that require site-specific work plans: Building 535, Building 680, and Building 742. Because of the complexity of the PCB sites at these buildings, separate work plans will be prepared to address implementation of a TSCA and/or CERCLA remedial action at these sites. The remaining PCB sites subject to additional TSCA evaluation will be approached based on the flowchart in Figure 3.1-1. PCB sites planned for site-specific, risk-based closure or that had initial characterization or remediation after August 28, 1998 will be cleaned up in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p).

Each PCB site subject to additional TSCA evaluation is categorized as either a high- or low-occupancy site. Prior to implementation of a TSCA remedial action, each PCB site will be evaluated to determine if additional sampling is necessary. In addition, the media at each PCB site subject to additional TSCA evaluation is categorized as either porous or non-porous.

Possible remedial actions at PCB sites include washing, scabbling, painting, encapsulation, capping, and excavation. Standard operating procedures for interim remedial actions are included in Appendix B of this document. The applicable TSCA remedial action is determined by the CA/FO default Substantive Cleanup Requirements (SCRs), exposure mitigation measures, or alternative SCRs, which are risk-based site cleanup requirements in accordance with 40 CFR 761.61, or addressed in accordance with 40 CFR 761.30(p) (LMI et al. 2001b). The following sections address each of these possible TSCA remedial actions.

4.3 Additional Verification Sampling

Based on visual observation and professional judgement, the number of required samples and/or sample locations may be increased to ensure that representative verification samples have been collected at each PCB site. Characteristics of each site will be evaluated to determine the number of necessary verification samples. These characteristics include the size of the PCB site, distribution of previous sample locations, potentially affected media, the type of sampling at the PCB site, and whether site conditions warrant further evaluation. The size of each PCB site at which a remedial action was previously performed is provided in Table 2.4-1. The affected media at these sites consist primarily of porous media: concrete, asphalt, soil, and wood. SOPs for additional sampling of each media are provided in Appendix B. The type of previous sampling was characterized by SSPORTS as grid, suspect, or stain-specific based on observations at the time of the initial assessment sampling. Additional samples may be required at:

- Sites where previous verification sampling did not adequately characterize the post-abatement conditions.
- Sites where elevated concentrations of PCBs (greater than 500 mg/kg) were detected in the SSPORTS initial assessment samples.
- Sites adjacent to ecologically sensitive habitats.
- Sites where a PCB release would have the potential to affect soil, groundwater, or surface water.
- Sites with residential future use (high degree of potential for human exposure).

Appendices E through J (organized by IA) provide figures of the previous sample locations at the PCB sites in IAs H2, D1, C3, B, C1, and C2, respectively. The evaluation of whether additional verification sampling is necessary at a PCB site is also provided in these IA-specific appendices (Appendices E through J).

4.4 Substantive Cleanup Requirements

According to Paragraph 7 of the CA/FO, with respect to any portion of the EETP contaminated with PCBs where the Navy either performed cleanup prior to August 28, 1998 or determined prior to August 28, 1998 that no cleanup was needed under TSCA, USEPA will determine the adequacy of the cleanup or make a decision that no cleanup was needed in accordance with the SCRs shown below (LMI et al. 2001b). In Paragraph 8 of the CA/FO, both default SCRs and alternative SCRs are defined, with the difference being that the alternatives to the default requirements are for areas that satisfy a site-specific, risk-based disposal approval issued in accordance with 40 CFR 761.61(c). The SCR options are:

a. Default SCRs

(i) For all high-occupancy areas (see 40 CFR 761.3):

(A) For non-porous surfaces (as defined in 40 CFR 761.3), wipe samples must demonstrate less than 10 µg/100cm^2.

(B) For PCB bulk remediation waste (see 40 CFR 761.61(a)(4)(i)), which includes porous surfaces or contaminated soil, core samples for soil and/or chip samples for concrete or wood must demonstrate:

- less than 1 parts per million (ppm); or
- 1 to 10 ppm with a cap (see 40 CFR 761.61(a)(7) for capping requirements).

(ii) For all low-occupancy areas (see 40 CFR 761.3):

(A) For non-porous surfaces (as defined in 40 CFR 761.3), wipe samples must demonstrate less than 100 µg/100cm^2.

(B) For PCB bulk remediation waste (see 40 CFR 761.61(a)(4)(i)), which includes porous surfaces or contaminated soil, core samples for soil and/or chip samples for concrete or wood must demonstrate:

- less than 25 ppm; or
- greater than or equal to 25ppm to less than or equal to 50 ppm, if the site is secured by a fence and marked with a sign indicating the TBD mark; or
- greater than or equal to 25 to less than or equal to 100 ppm with a cap (see 40 CFR 761.61(a)(7) for capping conditions).

(iii) For areas in (i) and (ii) that are capped:

(A) Capping requirements are described in 40 CFR 761.61(a)(7); and

(B) Submit an operations and maintenance plan to USEPA for approval.

(iv) Deed restrictions in accordance with the requirements in 40 CFR 761.61(a)(8) are required for all areas that have been capped in high-occupancy areas and for all areas that have been cleaned up using the low-occupancy area standard (see Section 4.7).

b. Alternative SCRs

As an alternative to the default requirements in a. (above), areas may be cleaned as approved by USEPA, in writing, in a site-specific, risk-based disposal approval, issued in accordance with 40 CFR 761.61(c). The site-specific, risk-based approval may include cleanup levels, verification sampling procedures, operations and maintenance requirements, and/or deed restrictions. The following risk-based approvals are for the concrete and/or wood floors in industrial areas, where no children are allowed on a regular basis.

(1) For concrete and wood floors with an average PCB concentration of greater than 5 ppm and less than 10 ppm with a maximum concentration of 25 ppm in any sample where there are two coats of paint of contrasting colors on the floors, the PCBs are disposed of and require no further remediation provided that there is a deed restriction, comparable to those in 40 CFR 761.61(a)(8), to preserve these conditions.

(2) For concrete and wood floors with an average PCB concentration of 5 ppm or less, with a maximum concentration of 10 ppm in any sample, the PCBs are disposed of and require no further remediation provided that there is a deed restriction limiting the property to industrial use.

The characterization of average PCB concentrations in concrete and wood floors will be based on: a representative sampling scheme (including historical information on the cleanup data and use of the floor), covering the breadth of contaminated locations, or any other sampling approach approved by USEPA; chip samples taken from the surface of dry concrete or wood that was contaminated or presumed contaminated by PCBs; and chemical extraction and analysis procedures acceptable to USEPA for determining the concentration of PCBs (LMI et al. 2001b). In those cases where the average is deemed appropriate for characterizing the representative PCB concentrations in concrete and/or wood floors, the term "average" is defined as the 95 percent upper confidence limit (UCL) of the mean (LMI et al. 2001b).

4.5 Exposure Mitigation Measures

As an alternative to the default and alternative SCRs, contaminated concrete that has not exceeded its useful life may be encapsulated in accordance with the requirements of 40 CFR 761.30(p) (LMI et al. 2001b). When such encapsulation is used on concrete, deed restrictions are required if PCB concentrations in the concrete are greater than or equal to 1 ppm in high-occupancy areas, greater than 10 ppm in industrial, or greater than or equal to 25 ppm in low-occupancy areas. Wood that contains PCBs where core or chip samples show greater than or equal to 10 ppm in high-occupancy areas, or greater than or equal to 25 ppm in low-occupancy areas, must be removed and disposed and cannot be encapsulated (LMI et al. 2001b).

There are six PCB sites in the EETP (Building 672 AL#01, Building 690 AL#01, Building 898 AL#01, Building 1310 AL#01, Building 1322 AL#01, and Building H72 AL#01) that are already encapsulated concrete, in use, and with a remaining useful life. Exposure mitigation measures will be implemented at these six PCB sites. These sites are subject to the requirements of 40 CFR 761.30(p), which includes deed restrictions (see Section 4.7).

4.6 PCB Sites that do not Meet the SCRs or Where SCRs are not Applicable

PCB sites where the Navy did not perform cleanup prior to August 28, 1998 or did not determine prior to August 28, 1998 that cleanup was not needed under TSCA will be cleaned up in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p). In addition, if USEPA determines that a specific site does not meet the SCRs shown above after any necessary supplemental sampling has been completed, then the PCB site will be cleaned up in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p).

Remediation in accordance with 40 CFR 761.61 allows for three options for PCB remediation waste disposal: 1) self-implementing on-site cleanup and disposal of PCB remediation waste [Section 40 CFR 761.61(a)]; 2) performance-based disposal [Section 40 CFR 761.61(b)]; and, 3) risk-based disposal approval [Section 40 CFR 761.61(c)]. Remediation in accordance with 40 CFR 761.30(p) allows for continued use of porous surfaces contaminated with PCBs if certain conditions are met.

The self-implementing cleanup option requires adequate site characterization (40 CFR 761.260) and sampling to verify completion of remediation (40 CFR 761.280). The self-implementing procedures may not be used to clean up surface or groundwater, sediments, sewers or sewage treatment systems, drinking water sources or distribution systems, grazing lands, or vegetable gardens. Notification, as described in 40 CFR 761.61(a)(3), is required for the self-implementing cleanup and disposal option found at 40 CFR 761.61(a). This notification (notice for application of approval) needs to include the following five components: 1) nature of the contamination (including media); 2) summary of the procedures used to sample the site and adjacent areas, with a table showing the PCB concentrations; 3) location and extent of contamination, including topographic maps with sample locations cross referenced to the sample identification numbers in the data summary table; 4) cleanup plan for the site (including schedule, disposal technology, and approach); and 5) a certification that all sampling plans and sampling and analysis procedures used to characterize the site are on file and available for USEPA inspection. Record-keeping, in accordance with 40 CFR 761.125(c)(5), must be maintained for 5 years following cleanup under the self-implementing option.

The risk-based disposal approval option also requires written approval by USEPA of an application that notifies USEPA of the nature and extent of the PCB contamination along with a cleanup plan for the site (as described in 40 CFR 761.61(a)(3)). USEPA will issue a written decision on each application for a risk-based method for PCB remediation wastes. The application will be approved if USEPA finds that the method will not pose an unreasonable risk to health or the environment.

The self-implementing cleanup level (i.e., the "walk-away" level) for soil and porous surfaces in high-occupancy (e.g., residential) areas is less than or equal to 1 ppm, or less than or equal to 10 ppm if the soil is capped [Section 761.61(a)(4)(i)(A)]. The cleanup level in low-occupancy (e.g., electrical substation) areas is less than or equal to 25 ppm to less than or equal to 100 ppm, depending on site conditions [Section 761.61(a)(4)(i)(B)(1-4)]. Site conditions which would allow for remaining PCB concentrations to be greater than 25 ppm PCBs include: 1) greater than 25 ppm and less than or equal to 50 ppm—site secured by a fence and signage; 2) greater than 50 ppm and less than or equal to 100 ppm—site covered by a cap. In the regulatory text, a cap is defined as a minimum of 10 inches of compacted soil or 6 inches of concrete or asphalt to prevent or minimize human exposure, infiltration of water, and erosion [Section 761.61(a)(7)]. Deed restrictions may also need to be in place (see Section 4.7).

Site-specific factors may warrant additional cleanup to levels lower than those included in the USEPA PCB regulations summarized above upon finding that remediation is required to prevent unreasonable risk. Potential site-specific factors include: PCB site is adjacent to ecologically-sensitive habitat; PCB site has the potential to affect groundwater or surface water; or location of the PCB site has a high potential for exposure.

Remediation in accordance with 40 CFR 761.30(p) involves both the removal of the PCB source and superficial surface cleaning. Continued use of PCB-contaminated porous surfaces can occur for the remainder of the useful life of the surface and subsurface material if the following conditions are met: 1) removal of the source to prevent further release to the porous surface; 2) superficial surface cleaning (double-wash rinse procedure) if the porous media is accessible; 3) cover the accessible and areas inaccessible to clean up with either a

two color coating or a solid barrier fastened to the surface; and 4) mark the surface (signage). Removal of the PCB contaminated porous surface from its location is prohibited except for reasons of disposal and then may be subject to additional disposal requirements.

4.7 Deed Restrictions

Deed restrictions may be required at some of the PCB sites in the EETP, depending upon the applicable SCR (see Section 4.4) or if site cleanup is in accordance with 40 CFR 761.30(p) or 40 CFR 761.61. Under 40 CFR 761.61(a)(8), deed restrictions are required for PCB sites with caps, fences, or low-occupancy areas.

Under the CA/FO, continued use is authorized for porous surfaces that have been and continue to be in compliance with 40 CFR 761.30(p). Encapsulated sites must follow the requirements of the CA/FO paragraphs 7, 8(c), 9, 10, and 11 (LMI et al. 2001b). With this scenario, subsequent transferees or their lessees may use these porous surfaces provided that the use is limited to industrial activities and compliance with PCB-related requirements regarding use, operations and maintenance, and disposal.

When cleanup under 40 CFR 761.61(a) includes the use of a fence or cap, the fence or cap must be maintained by the owner in perpetuity. In addition, when a cap or low-occupancy requirements are in place, the owner must record and submit a certification that the deed restriction was completed in accordance with 40 CFR 761.61(a)(8)(i)(A) within 60 days of completion of the cleanup activity.

Where deed restrictions are required, LMI shall record an appropriate covenant to restrict the use of the portions of the property being transferred (Environmental Restriction) that is binding upon each successive owner and runs with the land pursuant to California Civil Code Section 1471 prior to transfer by LMI to a third party. Such a covenant shall be enforceable by the DTSC pursuant to the California Health and Safety Code Section 25355.5 and Civil Code Section 1471(c) and shall name the City of Vallejo and USEPA as third-party beneficiaries. The language of the deed restriction to be recorded will restrict development to those uses consistent with commercial/industrial land use.

The owner of property with a deed restriction may remove the notice on the deed by conducting additional cleanup activities that achieve the cleanup levels specified under 40 CFR 761.61(a)(4), which does not require caps, fences, or low-occupancy areas.

4.8 Summary of Approach

Each PCB site was evaluated with respect to the options in Figure 3.1-1. Based on this evaluation, a proposed approach was developed for each PCB site subject to additional TSCA evaluation. Table 4.7-1 presents the proposed approach for each of these PCB sites.

After thorough evaluation of previous Navy work, 170 of the 225 PCB sites subject to additional evaluation under TSCA do not require further remedial action. Sufficient remedial action has already occurred at these sites, and the remaining PCB concentrations meet an applicable default or alternative SCR; however, some of these sites do require deed restrictions. Separate site-specific work plans will be written to address the 18 PCB sites at

Buildings 535, 680, and 742. Three PCB sites at Building 516 will be addressed as part of IRP Site IR12. The proposed action at the remaining PCB sites is presented in Table 4.7-1. These actions include performing site visits and limited verification sampling, removing wood-block flooring during building deconstruction, scabbling, soil excavation, washing, applying two coats of paint on a building floor, implementation of exposure mitigation measures, and recording of any necessary deed restrictions. The SOPs for these remedial actions are provided in Appendix B. More specific details regarding these remedial actions are provided in the IA-specific appendices (Appendices E through J). In addition, site-specific notifications will be submitted to USEPA and DTSC for approval.

Insert Table 4.1-1

Insert Table 4.7-1

5.0 Process for Completing Necessary Actions Under CERCLA

This section provides a description of the process for completing necessary actions at the PCB sites in the EETP at Mare Island to satisfy CERCLA requirements.

5.1 Introduction

The process for completing necessary actions at the PCB sites under CERCLA is shown in Figure 3.1-1.

5.2 Approach for CERCLA Actions

If a PCB site is not subject to additional TSCA evaluation (sites where abatement has not been performed or sites with a maximum detected PCB concentration of not greater than 1.0 mg/kg or 10 µg/100cm^2), then the site will be evaluated by the "CERCLA to NFA" flowchart shown in Figure 3.1-1. In accordance with this flowchart, if there is a known PCB release to soil or groundwater at a site, the site will be remediated to the appropriate PRG or subject to site-specific, risk-based closure. In addition, if there is a potential source of PCB contamination present and the site will not be encapsulated or capped under TSCA with a deed restriction, then the site will be evaluated for a visible pathway for migration to soil and/or groundwater (e.g., crack in a concrete pad or stain extending to edge of pad surrounded by soil). A limited investigation to determine if there was a release to the environment will be performed if there is a visible pathway for PCB migration to soil and/or groundwater. NFA criteria are met at a site if the limited investigation does not identify a release of PCBs to the environment. If the limited investigation results indicate that there is a PCB release to soil and/or groundwater at a site, the site will be remediated to the appropriate PRG (if necessary) or subject to site-specific, risk-based closure.

If a PCB site is subject to additional TSCA evaluation but will not be encapsulated or capped under TSCA with a deed restriction, the site will be evaluated by the "CERCLA/TSCA to NFA" flowchart shown in Figure 3.1-1. This process is identical to the "CERCLA to NFA" process described above; however, these sites must also satisfy TSCA in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p).

5.3 Process for Additional Site Characterization

The process for additional site characterization under CERCLA is similar to the process for additional verification sampling at PCB sites subject to additional TSCA evaluation, as presented in Section 4.3. Additional samples may be required at some PCB sites if the number of previous samples are not adequate, distribution of sample locations is not adequate, previous samples did not include a necessary media, or site conditions appear to warrant further evaluation. If there is evidence of a potential pathway for migration of PCBs

to soil and/or groundwater, then additional site characterization samples will be collected to confirm/demonstrate that there was a release to the environment.

Based on visual observation and professional judgement, the number of sample locations may be increased to ensure that representative samples are collected at each PCB site. Appendices E through J (organized by IA) provide figures of the previous sample locations at the PCB sites in IAs H2, D1, C3, B, C1, and C2, respectively. The evaluation of whether additional sampling is necessary at a PCB site will be provided in these appendices. More specific details regarding the evaluation of whether additional sampling is necessary at a PCB site are provided in these IA-specific appendices.

5.4 Process for Site Remediation and Risk Evaluation

Sites with PCB contamination in soil and/or groundwater will be cleaned up to PRGs or undergo a risk evaluation (for site-specific, risk-based closure). Possible CERCLA remedial actions at PCB sites include capping and soil excavation. SOPs for interim remedial actions are included in Appendix B of this document.

The human health risk evaluations for PCB sites will include:

1. Identify designated future land use (i.e., residential, recreational, or commercial/industrial) by using the LMI land use map (LMI 2000) to determine appropriate future land use for the PCB site.

2. Develop site conceptual model by identifying potential sources, migration pathways, media of concern, and receptors associated with the PCB site.

3. Compile data set for each PCB site based on the potential receptors and media of concern identified in the site conceptual model (e.g., surface soil, mixed-zone soil, groundwater).

4. Calculate exposure point concentrations (EPCs) for the PCB site based on the assumption that each PCB site will be a separate "exposure area." Calculate the 95 percent upper confidence limit on the mean (95UCL) using the data set(s) for the site. The EPCs is based on the lower of the maximum detected concentration or the 95UCLs to evaluate reasonable maximum exposure conditions.

5. Perform screening-level assessment of soil data by comparing the soil EPCs to USEPA Region 9 PRGs (USEPA 2002b) for either residential soil or industrial soil (depending on the designated future land use) using the methodology specified in the supporting documentation for the Region 9 PRGs (USEPA 2002b). Potential carcinogenic risks will be evaluated by calculating the ratio of the EPC for an individual PCB constituent to the corresponding carcinogenic PRG and multiplying by 1×10^{-6}. In order to evaluate potential cumulative effects, the cancer risks for all PCB constituents will be summed. Potential non-carcinogenic effects will be evaluated by calculating the ratio of the EPC for an individual PCB to the corresponding non-carcinogenic PRG. The ratios for all PCB constituents will be summed to represent a Hazard Index.

6. Refine risk calculations based on site-specific information. For sites with concentrations of PCBs in soil that exceed the Region 9 PRGs based on the screening-level exposure

assumptions (full-time residential or commercial/industrial), a risk assessment may be performed using exposure assumptions specific for the conditions of the site (based on the site conceptual model). Potential carcinogenic risks and non-cancer hazards will be evaluated using the site-specific exposure assumptions. If PCBs are detected in groundwater, a site-specific evaluation of the risks associated with potential exposure of construction workers to groundwater through dermal contact will be performed. (Note: Groundwater is not used for drinking water purposes at Mare Island and, therefore, there are no complete exposure pathways associated with drinking water to be evaluated in the human health risk assessment.)

The overall approach to the ecological risk evaluations for soil and groundwater at each PCB site will be consistent with the phased approach recommended by USEPA guidance (e.g., USEPA 1992a-b) and California-specific guidance available from the DTSC (DTSC 1996). Evaluation of risks from chemical stressors will be conducted for soil microbial processes, plants, invertebrates, birds, and mammals in upland habitat, and for aquatic organisms, wetland plants, birds, and mammals in wetland habitats in or near the respective site that may be affected by migration (via groundwater transport or surface runoff, if any) from the site.

A screening-level evaluation will be performed for each site to evaluate habitats and potential receptors present, and to determine whether complete exposure pathways exist. If appropriate, a more detailed screening-level baseline risk assessment will be performed for sites where ecological receptors may be exposed to site-related contaminants. Information from the *Final Onshore Environmental Risk Assessment* (TtEMI 2002a) and the *Revised Final Offshore Environmental Risk Assessment* (TtEMI 2002b) will be used when possible.

5.5 Summary of CERCLA Approach

Table 5.5-1 presents the proposed approach for PCB site closure to satisfy CERCLA requirements. All 428 PCB sites listed in the Consent Agreement and the 117 PCB sites identified during the development of the IA-specific site identification technical memoranda are listed in Table 5.5-1. The following presents the proposed approaches for site closure under CERCLA:

- CERCLA to NFA: No known release to soil or groundwater; no potential source and no PCB contamination present: NFA.
- CERCLA to NFA: No known release to soil or groundwater; potential source and PCB contamination present; site to be encapsulated or capped under TSCA with deed restriction: NFA.
- CERCLA to NFA: No known release to soil or groundwater; potential source and PCB contamination present; site not to be encapsulated or capped under TSCA; no visible pathway for migration to soil or groundwater: NFA.
- CERCLA to NFA: No known release to soil or groundwater, potential source and PCB contamination present; site not to be encapsulated or capped under TSCA; visible pathway for migration to soil or groundwater. Perform limited investigation; no confirmed release of PCBs to the environment: NFA.

- CERCLA to NFA: Known release to soil or groundwater; If required, perform additional site characterization. PCB concentrations do not exceed applicable PRGs: NFA.
- CERCLA to NFA: Known release to soil or groundwater. If required, perform additional site characterization; PCB concentrations do exceed applicable PRGs. Remediate site to PRG or perform site-specific, risk-based closure: NFA.
- CERCLA/TSCA to NFA: No known release to soil or groundwater; no potential source and PCB contamination present, or site to be encapsulated or capped under TSCA, or no visible pathway for migration to soil or groundwater, or no confirmed release of PCBs to the environment. Site cleanup in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p): NFA.
- CERCLA/TSCA to NFA: Known release to soil or groundwater. If required, perform additional site characterization; PCB concentrations do not exceed applicable PRGs. Site cleanup in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p): NFA.
- CERCLA/TSCA to NFA: Known release to soil or groundwater. If required, perform additional site characterization; PCB concentrations do exceed applicable PRGs; remediate site to PRG or perform site-specific, risk-based closure; site cleanup in accordance with 40 CFR 761.61 or addressed in accordance with 40 CFR 761.30(p): NFA.

The SOPs for the sampling and remedial actions are provided in Appendix B. Appendices E through J (organized by IA) provide figures of the previous sample locations at the PCB sites in IAs H2, D1, C3, B, C1, and C2, respectively. In addition, these appendices provide any site specifics related to necessary additional sampling and/or remediation.

Insert Table 5.5-1

6.0 Process for PCB Site Closure

The USEPA CA/FO requires that all submittals to DTSC regarding PCB contamination or remediation will also be provided to USEPA to confirm compliance with the provisions of the CA/FO. The USEPA will be notified of any DTSC schedule changes, should the schedule change affect PCB site sampling and/or remediation.

As requested by USEPA, each IA-specific remedial investigation report will contain information on the PCB sites located in that IA. The remedial action plan for each IA will demonstrate that the PCB site concerns have been mitigated and do not represent a significant risk to human health and the environment or propose any necessary outstanding remedial action. The schedule for PCB site closure is discussed further in Section 8.0.

The remedial action plans for IA D2 and IA A3 were submitted to the Regulatory Agencies in April and May 2002, respectively (CH2M HILL 2002g-h). Both of these documents demonstrated that the NFA criteria have been met at the PCB sites in these IAs. Appendices C and D to this work plan provide the supporting information for no further action at the PCB sites in IA A3 and IA D2, respectively. In addition, site-specific notifications will be submitted to USEPA and DTSC for approval.

7.0 Standard Operating Procedures

This section provides descriptions of the SOPs for the PCB sites in the EETP at Mare Island. More detail regarding these SOPs are provided in Appendix A and B.

7.1 Health and Safety

The PCB work plan will be implemented following the sitewide HSP presented in Appendix G of the SGWMP. Additional PCB-specific HSP forms and procedures are provided in Appendix A of this work plan. All field personnel will be equipped with the appropriate personal protection equipment, as explained in Appendix A.

The Site Safety Officer for the project will be:

Mr. Carey Von Williams
CH2M HILL Constructors, Inc.
Telephone: Work (707) 562-1015
Pager TBD
Home (925) 963-2509

7.2 Sampling

Sampling for PCBs will be completed in accordance with the QAPP (CH2M HILL 2001a) and the SGWMP (CH2M HILL 2001b). The specific sampling methodology, documentation, shipment, and quality control specifications for the implementation of this work plan can be found in the QAPP. SOPs specific to sampling at PCB sites are provided in Appendix B1 of this work plan.

The sampling media will consist primarily of asphalt, concrete, soil, and wood. The following types of sampling may be used at the PCB sites in the EETP: chip, core, wipe, surface soil, and direct push soil sampling. Information on the sampling techniques for each sample type and media is provided in Appendix B1.The following sections summarize the sampling designation, field quality control samples, and sample handling and custody.

7.2.1 Sample Designation

According to the Mare Island QAPP, each sample will have a unique identification code that will be composed of five components: sample area, sample type, sample number, sample matrix, and depth (CH2M HILL 2001b).

7.2.1.1 Sample Area

The first component will be the sample area designation. For PCB site sampling, all samples will have the sample designation related to the associated building number (i.e., sampling at Building 521 will have the sample area designation “B521”).

7.2.1.2 Sample Type

The second component will be the sample type designation. For chip samples the designation of "CH" will be used.

7.2.1.3 Sample Number

The third component will be the sample number. Sample numbers will start at 0100 and increase consecutively.

7.2.1.4 Sample Matrix

The fourth component will be the sample matrix:

- Asphalt – A
- Concrete – C
- Soil – S
- Wood – W

7.2.1.5 Depth

The fifth component will indicate the depth at which the sample was taken. This depth will be measured from below the existing grade.

7.2.2 Field Quality Control Samples

Quality control samples will be collected to monitor accuracy, precision, and the presence of field contamination for analytical methods to be performed in the off-site laboratory. All field quality control samples will be sent double-blind to the laboratory along with regular field samples.

7.2.2.1 Field Duplicate Samples

A field duplicate is an independent sample collected as close as possible to the original sample from the same source under identical conditions, and is used to document sampling and analytical precision. Field duplicates will be collected at a minimum frequency of 10 percent or one per sampling event, whichever is more frequent, for each matrix and for each type of analysis. The sampling locations for field duplicate samples will be recorded in the field logbook.

7.2.2.2 Equipment Blanks

Equipment rinsate blanks will be collected to evaluate field sampling and decontamination procedures by pouring deionized water over the decontaminated equipment. Equipment rinsate blank will be collected at a 5 percent frequency for each equipment type that is decontaminated. The equipment blanks will be analyzed in the off-site laboratory for the same parameters specified for the corresponding matrix.

7.2.2.3 Matrix Spike/Matrix Spike Duplicate

A matrix spike and matrix spike duplicate (MS/MSD) consist of duplicate field sample aliquots spiked by the laboratory with analytes of concern to evaluate the effects of the matrix on the recoveries of these analytes. For every 20 field samples of each matrix

collected from each site, additional duplicate aliquots of one of the samples should be collected for each analysis and designated on the chain-of-custody form for use as MS/MSD by the laboratory. The duplicate aliquots for MS/MSD analyses should be collected simultaneously or in immediate succession with the parent sample. MS/MSD samples will be treated in the same manner as the parent sample during storage and shipment. The sampling locations for the MS/MSD will be documented in the field logbook.

7.2.3 Sample Handling and Custody

Information regarding the collection of each sample will be recorded in a field logbook. A separate logbook will be used for implementation of this work plan. The field logbook will be bound with consecutively-numbered pages. All entries will be legibly written in black ink and signed and dated by the individual making the entries. Factual and objective language will be used. All entries will be complete and accurate enough to allow reconstruction of each field activity. The following information will be recorded during the collection of each sample:

- Sample location and description
- Sample identification
- Sampler's name
- Date and time of sampling
- Sample matrix
- Type and identification of sampling equipment used
- Field observations that may be relevant

The contracted analytical laboratory will provide the required sample containers for all samples, including quality control. All containers will have been cleaned and certified free of the analytes of concern for this project. No sample containers will be reused. The contracted laboratory will add preservatives, if required, prior to shipping the sample containers to the field. The laboratory, upon receipt of the samples, will verify the adequacy of preservation and will add additional preservative, if necessary. The sample identification, and date and time of sampling are entered on the label immediately after collection. The labels must be secured using clear tape to maintain the identification of each sample. The containers, minimum sample quantities, required preservatives, and maximum holding times are shown in Table 7.2-1.

Procedures must be taken to preserve and ensure the integrity of all samples from the time of collection through analysis. Sample custody records must be maintained both in the field and in the subcontractor laboratory. A sample is considered to be in an individual's custody if it is in his or her physical possession or view, locked up, or kept in a secured and restricted area. Until the samples are shipped, sample custody will be the responsibility of the sampling team leader.

Chain-of-custody records document sample collection and shipment to the laboratory. A chain-of-custody form will be completed in triplicate for each sampling event. The laboratory copy will be delivered with the sample-shipping cooler, and the third copy will be retained in the field documentation files. The chain-of-custody form will identify the contents of each shipment and maintain the custodial integrity of the samples. All chain-of-

custody forms will be signed and dated by the responsible sampling team personnel. The "relinquished by" box will be signed by the responsible sampling team personnel, and the date, time, and air bill number will be noted on the chain-of-custody form. A self-adhesive custody seal will be placed across the lid of each sample to maintain its integrity until the laboratory opens it. The shipping coolers containing the samples will be sealed with a custody seal any time they are not in an individual's possession or view before shipping. All custody seals will be signed and dated by the responsible sampling team personnel.

Custody must be maintained at the laboratory once samples are received until all tests are completed. This will be accomplished using an internal custody system that requires samples to be kept in a secured and restricted area when not in use, and to be checked out and checked back in by the analysts who use them. Internal custody records must be maintained by the laboratory as part of the documentation file for each sample.

Sample coolers will be transported to the laboratory (an overnight courier will be used if possible) immediately after sample collection. Intermediate stops should be avoided, with the exception of emergencies; in which case, the situation should be noted in the field notebooks. The laboratory should be notified that samples are being shipped.

TABLE 7.2-1
Sample Containers, Preservation, and Holding Times
Mare Island, Vallejo, California

		Container and Minimum Quantity						
Analyte	**Method**	**Wood**	**Water**	**Soil**	**Concrete**	**Wipe**	**Preservation**	**Holding Time**
PCBs	SW8082	30 grams/8 oz (G) or plastic bag	1-Liter Amber (G)	40 grams/4 oz(G)**	30 grams / 8oz (G)	1 Wipe / 4 oz(G) with hexane	Chilled, 4°C	Water: 7 days to extraction; 40 days to analysis Soil/Wood/Concrete/ Wipe: 14 days to extraction; 40 days to analysis

Glass (G); glass with Teflon-lined cap (G-TLC), Not Applicable (N/A)

**A 4-oz container will be supplied by the laboratory, but a minimum of 40 grams is needed to complete the analysis

7.3 Interim Remedial Actions

Interim remedial actions at PCB sites include washing, scabbling, painting, encapsulation, capping, and excavation. Standard operating procedures for interim remedial actions are included in Appendix B of this document.

The procedure for washing entails triple-rinsing a PCB-contaminated surface and is described in Appendix B2. The procedure for scabbling entails removing a layer of a PCB-contaminated surface, and is described in Appendix B3. The procedure for painting entails applying two coats of solvent resistant and water-repellant paint of contrasting colors to a PCB-contaminated surface and is described in Appendix B4. The procedure for

encapsulation entails enclosing the joint between a transformer and the underlying surface with epoxy-based mortar or applying an epoxy-based coating directly to PCB-contaminated concrete, and is described in Appendix B5. The procedure for capping entails covering a site with 10 inches of clean soil and is described in Appendix B6. The procedure for excavation entails removing and disposing of PCB-contaminated material such as asphalt or soil and is described in Appendix B7.

Tables 4.7-1 and 5.2-1 present the proposed approach for PCB site closure under TSCA and CERCLA, respectively.

7.4 Deed Restrictions

Deed restrictions may be required at some of the PCB sites in the EETP, depending upon the applicable SCR or if site cleanup is in accordance with 40 CFR 761.61. Under 40 CFR 761.61(a)(8), deed restrictions are required for PCB sites with caps, fences, or low-occupancy areas.

Under the CA/FO, continued use is authorized for porous surfaces that have been and continue to be in compliance with 40 CFR 761.30(p). With this scenario, subsequent transferees or their lessees may use these porous surfaces provided that the use is limited to industrial activities and compliance with PCB-related requirements regarding use, operations and maintenance, and disposal. Prior to such transfer by LMI to a third party, LMI has to record an appropriate covenant to restrict the use of the portions of the property being transferred (Environmental Restriction) that is binding upon each successive owner and runs with the land pursuant to California Civil Code Section 1471. Such a covenant shall be enforceable by the DTSC pursuant to the California Health and Safety Code Section 25355.5 and Civil Code Section 1471(c) and shall name the City of Vallejo and USEPA as third-party beneficiaries. The language of the new covenant to be recorded will prohibit the use of groundwater beneath the property as a drinking water source and restricting development to those uses consistent with commercial/industrial land use.

8.0 Implementation Schedule

By achieving the objectives of this work plan (see Section 1.1), the PCB site remediation in the EETP will be streamlined and accelerated. Following the regulatory agency approval of this work plan, PCB site remediation and any necessary sampling will begin. An implementation schedule is provided as Figure 8.1-1. The schedule is primarily driven by the IA-specific remedial action plan dates.

The following sections provide information regarding site security, access, permits and notifications, site restoration, and site demobilization.

8.1 Site Security

During remediation activities, a temporary chain-link panel fence will surround the entire site, including equipment storage areas; exclusion, decontamination, and support zones; and temporary soil stockpile areas that may be located adjacent to the excavation site. The intent is to protect the equipment, allow site control for a safe working environment, and prevent unauthorized entry into the work area. If necessary, traffic controls will be established.

8.2 Site Access

During all work activities, site access will be limited to authorized personnel. A sign-in log will be maintained at the site entrance for documenting entry and exit of all personnel.

8.3 Permits and Notifications

The following approvals, permits, and clearances are anticipated to be required for implementation of this PCB work plan:

- Utility clearances and notification of Underground Service Alert dig alert. Existing utility and piping that will be affected by the work activities will be identified. Any requirements, specifications, and/or permits pertaining to the affected utilities and piping will be obtained prior to initiation of remediation work at the site.
- City of Vallejo excavation permit, if necessary.
- Solano County boring permit, if necessary.
- Notification to the Bay Area Air Quality Management District.
- City of Vallejo Sanitation and Flood Control District permit to discharge waste water to the sanitary sewer.
- Notification to LMI.
- Notification to impacted tenants.

8.4 Site Restoration

Upon completion of the site work, the site will be restored to its pre-existing condition. This will be achieved by bringing the site to original grade with clean fill and reseeding with grass. All project-related temporary facilities will be removed from the site. All equipment used in handling impacted soil will be decontaminated prior to leaving the site. All site improvements, either temporarily removed or protected, will be restored to their original condition, and inspected to make sure they are functioning properly.

Any remaining materials, including protective clothing, debris, and general refuse, will be removed from the site and disposed of in the proper manner.

If necessary, pending groundwater sampling results, previously abandoned monitoring wells will be re-installed to meet regulatory requirements in accordance with required permits and DTSC approval.

8.5 Site Demobilization

Site demobilization will consist of the following activities:

- All equipment will be decontaminated in accordance with the procedures discussed in the SOPs.
- All temporary fencing will be removed.
- Final site cleanup will be performed.
- All vehicles and equipment will be decontaminated and demobilized from the site.
- Interested parties will be notified that work has been completed.

Insert Figure 8.1-1

9.0 References

CH2M HILL. 2001a. *Final Quality Assurance Project Plan (QAPP).* November.

_____. 2001b. *Soil and Groundwater Management Plan for Lennar Mare Island Guaranteed Fixed Price Contract*. November.

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Appendix A
Health and Safety Plan for PCB Site Sampling and Remediation

Appendix B
Standard Operating Procedures

B1
Sampling

B2
Washing

B3
Scabbling

B4
Painting

B5
Encapsulation

B6
Capping

B7
Excavation

B8
Disposal of Investigation-derived Waste

Appendix C
PCB Sites in Investigation Area A3

Appendix D
PCB Sites in Investigation Area D2

Appendix E
PCB Site Remediation/Verification Sampling Maps for IA H2

Appendix F
PCB Site Remediation/Verification Sampling Maps for IA D1

Appendix G
PCB Site Remediation/Verification Sampling Maps for IA C3

Appendix H
PCB Site Remediation/Verification Sampling Maps for IA B

Appendix I
PCB Site Remediation/Verification Sampling Maps for IA C1

Appendix J
PCB Site Remediation/Verification Sampling Maps for IA C2

Appendix K
Response to Comments on the
Draft Polychlorinated Biphenyl Work Plan

Appendix L
Compact Disc with the text/tables/figures for the Final Polychlorinated Biphenyl Work Plan and IA D1 PCB Site Photos